

Appl. No. 09/994,523
Amdt. Dated Oct , 2004
Reply to Office Action of Sep. 9, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An optical attenuator for attenuating signals in an optical path, comprising:

an input port for receiving input signals from an input fiber along the optical path;

an output port for splitting attenuated signals into two portions, and for transmitting one portion of the attenuated signals to an output fiber, also along the optical path, and for transmitting a second portion of the attenuated signals to a detecting means;

a fixed reflector;

a movable reflector, which in conjunction with the fixed reflector is for receiving first signals output by the input port and reflecting a portion of said first signals into the output port;

the detecting means being positioned to receive said second portion of the attenuated signals from the output port; and

a driving device for driving the movable reflector in response to control signals from the detecting means.

Claim 2 (original): The optical attenuator as claimed in claim 1, wherein the input port comprises a first collimator and a filter.

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Claim 3 (original): The optical attenuator as claimed in claim 2, wherein the filter has a 0.5 percent reflective ratio.

Claim 4 (previously amended): The optical attenuator as claimed in claim 2, wherein the first collimator retains an end of the input fiber and an end of a second fiber thereof, and said second fiber receives a part of the input signals reflected by the filter and transmits said part of the input signals reflected by the filter to the detecting means, and the detecting means uses said part of the input signals reflected by the filter together with said second portion of the attenuated signals from the output port to drive the driving device which moves the movable reflector.

Claim 5 (original): The optical attenuator as claimed in claim 1, wherein the output port comprises a second collimator.

Claim 6 (original): The optical attenuator as claimed in claim 1, wherein the detecting means includes a photodiode.

Claim 7 (currently amended): An optical attenuator for attenuating signals in an optical path, comprising:

an input port for receiving input signals from an input fiber along the optical path and for reflecting part of the input signals to a first detecting means;

an output port for splitting attenuated signals into two portions, and for transmitting one portion of the attenuated signals to an output fiber, also along the optical path, and for transmitting a second portion of the attenuated signals to a second detecting means;

a fixed reflector;

a movable reflector, which in conjunction with the fixed reflector is for receiving first signals output by the input port and reflecting a portion of said first signals into the output port;

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said first detecting means being positioned to receive said reflected part of the input signals from the input port;

said second detecting means being positioned to receive said second portion of the attenuated signals from the output port; and

a driving device for driving the movable reflector in response to control signals from said first and said second detecting means.

Claim 8 (original): The optical attenuator as claimed in claim 7, wherein the input port comprises a first collimator and a filter.

Claim 9 (original): The optical attenuator as claimed in claim 8, wherein the filter has a 0.5 percent reflective ratio.

Claim 10 (previously amended): The optical attenuator as claimed in claim 8, wherein the first collimator retains an end of the input fiber and an end of a second fiber thereof, and said second fiber receives the reflected part of the input signals.

Claim 11 (original): The optical attenuator as claimed in claim 7, wherein the output port comprises a second collimator.

Claim 12 (previously amended): The optical attenuator as claimed in claim 7, wherein the first and second detecting means each include a photodiode.

Claim 13 (currently amended): An optical attenuator for attenuating signals in an optical path, comprising:

an input port connected to an input fiber, the input fiber being a component of the optical path, the input port being for receiving an input signal from the input fiber;

an output port connected to an output fiber, the output fiber also being a component of the optical path, the output port being for transmitting an output signal to the output fiber;

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a fixed reflector;

a movable reflector, which in conjunction with the fixed reflector forms forming an optical connection between the input port and the output port;

a detecting means optically connected to the input port and to the output port and comprising components for detecting the intensity of optical signals from the input and output ports, circuitry for comparing the input signal to the output signal, and control circuitry; and

a driving device electrically connected to the control circuitry of the detecting means and mechanically engaged with the movable reflector;

whereby the input port transmits a fraction of the input signal, as a first control signal, to the detecting means and transmits the remainder of the input signal, as a first signal, to the fixed reflector and the movable reflector, the fixed reflector and the movable reflector ~~directs~~ direct the first signal toward the output port as a second signal, and some fraction of the second signal, determined by the relative spatial and angular geometry of the fixed reflector and the movable reflector, is received by the output port as a received signal, and the output port transmits one portion of the received signal as the output signal and transmits the remaining portion of the received signal as a second control signal, to the detecting means, the detecting means measures the intensities of the first and second control signals, makes a comparison of the intensities, and as a result causes its control circuitry to issue driving control signals to the driving device, which actuates the movable reflector to rotate, changing the intensity of the received signal at the output port.

Claim 14 (previously canceled)

Claim 15 (canceled)

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Claim 16 (original): The optical attenuator as claimed in claim 13, wherein the input port comprises a first collimator and a filter.

Claim 17 (original): The optical attenuator as claimed in claim 13, wherein the output port comprises a second collimator and a splitter.

Claim 18 (currently amended): An optical attenuator comprising:
an input port receiving input signals ~~from~~ from an input fiber;
an output port transmitting output signals to an output fiber;
a transmission device positioned in a light path transmitted between the input port and the output port, said transmission device adjustably attenuating transmitted signals moving along said light path;
a driving device moving said transmission device for attenuation adjustment; and

detecting means receiving signals from the input port and those from the output port to define an attenuation ratio thereof for determining actuation of the driving device; wherein

the first port includes a first collimator facing ~~[[to]]~~ said transmission device, and the second port includes a second collimator, different from the first collimator, facing ~~[[to]]~~ said transmission device; ~~wherein and~~

the signals said detecting means receives from the input port~~[[,]]~~ are reflected from the first port ~~without involvement of any splitters~~; while the signals said detecting means receives from the output port~~[[,]]~~ are directly derived from one outgoing port of a splitter of said output port, the output fiber being connected to the other outgoing port of said splitter.

Claims 19-20 (previously canceled)